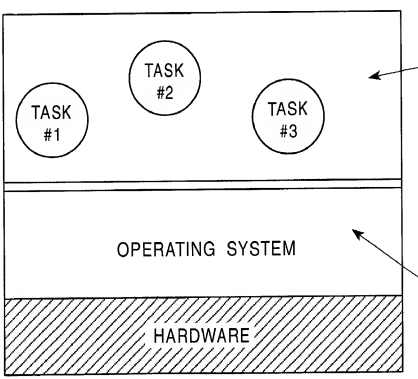
TOE270 SE2TT660

FIG. 1



TASK KEY AERA

X1, X2, ····· X8

(TASK KEY AREA EXISTS FOR ALL TASKS)

TASK KEY MANAGEMENT TABLE

TASK ID	TASK INITIAL KEY	TASK WORKING KEY
1	X1, X2, ····· X8	XW1, XW2, ····· XW8
2	Y1, Y2, ····· Y8	YW1, YW2, ····· YW8

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FIG. 2

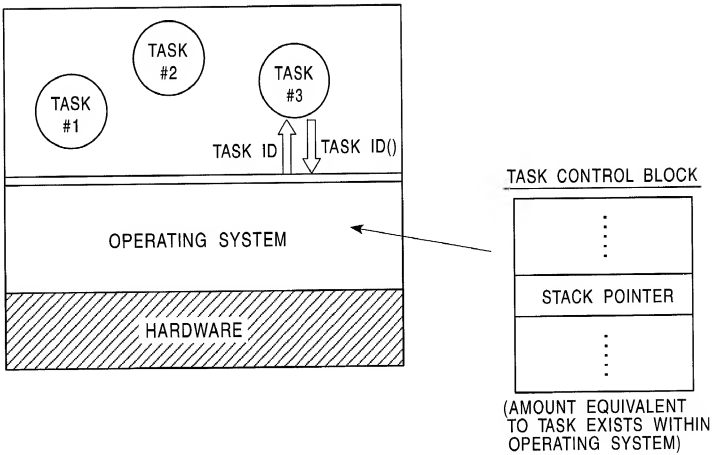

FIG. 3

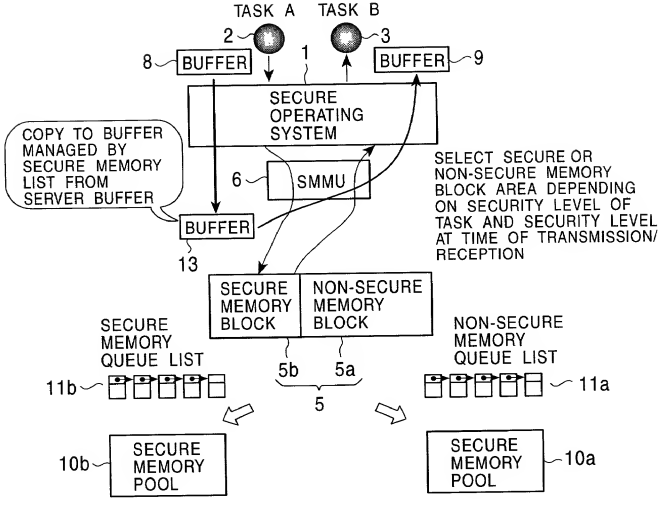

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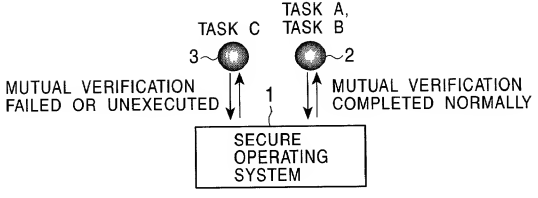
FIG. 4



TASK ID	SECURITY LEVEL	KEY INFORMATION
A	SECURE	KEY A
B	SECURE	KEY B
C	NON	NON
⋮	⋮	⋮
N-1	NON	NON
N	SECURE	KEY_N

SECURITY OPERATING SYSTEM INTERNALLY HOLDS SECURITY LEVEL (SECURE, NON-SECURE) FOR EACH TASK

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FIG. 5

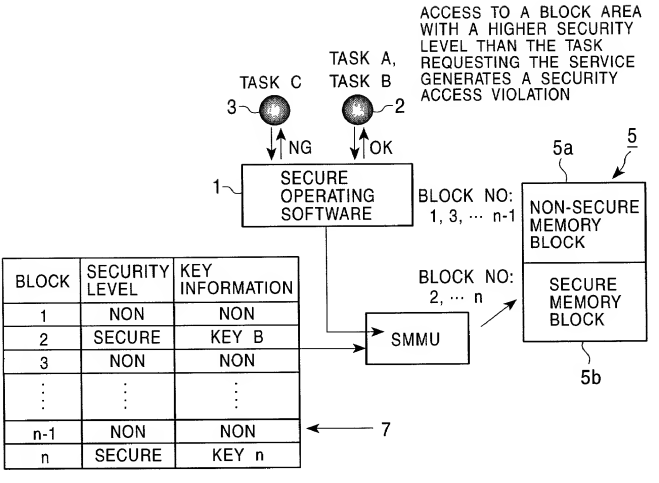
ACCESS TO A BLOCK AREA WITH A HIGHER SECURITY LEVEL THAN THE TASK REQUESTING THE SERVICE GENERATES A SECURITY ACCESS VIOLATION
TASK C
TASK A, TASK B
3
2
NG
OK
1
SECURE OPERATING SOFTWARE
BLOCK NO: 1, 3, ··· n-1
BLOCK NO: 2, ··· n
5a
5
NON-SECURE MEMORY BLOCK
SECURE MEMORY BLOCK
5b
SMMU
7
BLOCK
SECURITY LEVEL
KEY INFORMATION
1 NON NON
2 SECURE KEY B
3 NON NON
n-1 NON NON
n SECURE KEY n
SET SECURITY LEVEL FOR EACH BLOCK

FIG. 6

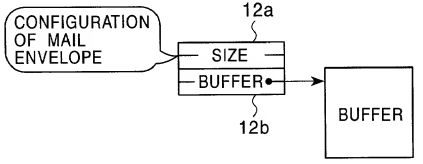
CONFIGURATION OF MAIL ENVELOPE
12a
SIZE
BUFFER
12b
BUFFER

FIG. 7

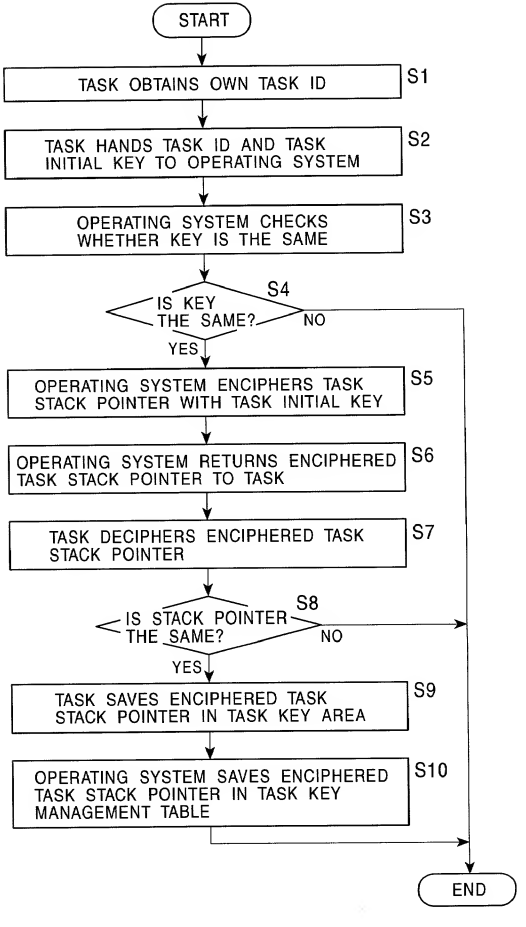

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FIG. 8

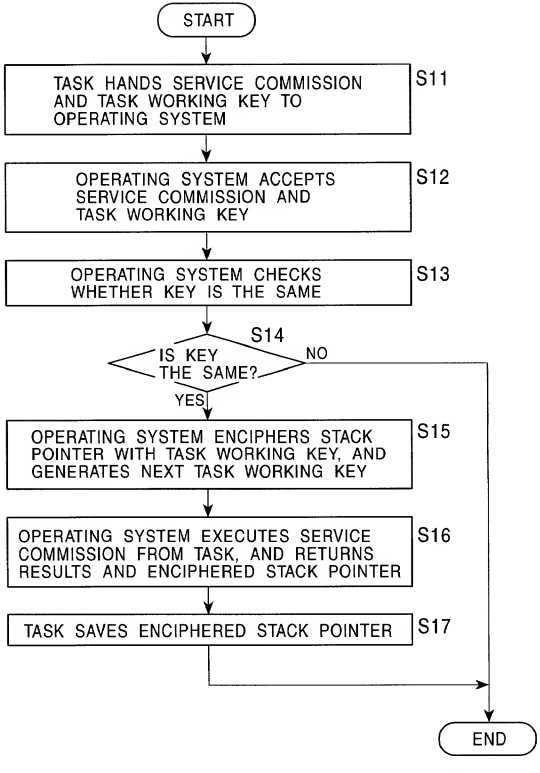

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FIG. 9

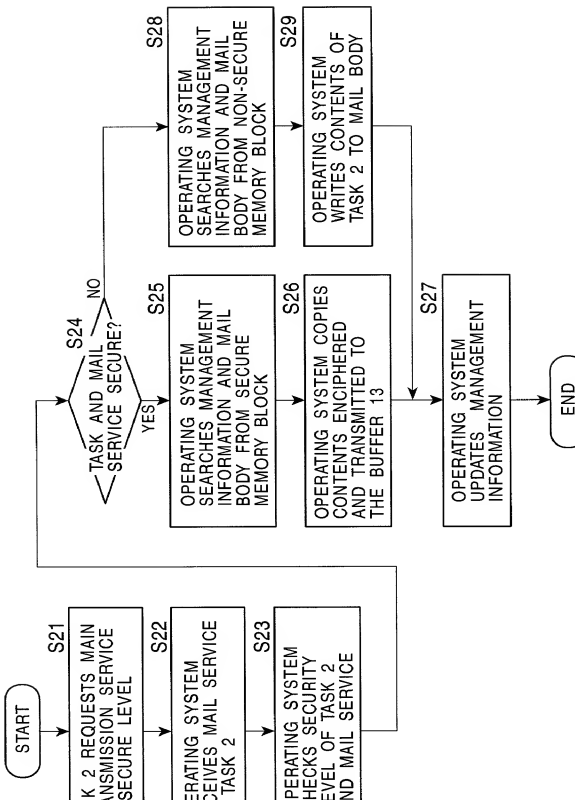
START
S21
TASK 2 REQUESTS MAIN TRANSMISSION SERVICE IN SECURE LEVEL
S22
OPERATING SYSTEM RECEIVES MAIL SERVICE OF TASK 2
S23
OPERATING SYSTEM CHECKS SECURITY LEVEL OF TASK 2 AND MAIL SERVICE
S24
TASK AND MAIL SERVICE SECURE?
YES
NO
S25
OPERATING SYSTEM SEARCHES MANAGEMENT INFORMATION AND MAIL BODY FROM SECURE MEMORY BLOCK
S26
OPERATING SYSTEM COPIES CONTENTS ENCIPHERED AND TRANSMITTED TO THE BUFFER 13
S28
OPERATING SYSTEM SEARCHES MANAGEMENT INFORMATION AND MAIL BODY FROM NON-SECURE MEMORY BLOCK
S29
OPERATING SYSTEM WRITES CONTENTS OF TASK 2 TO MAIL BODY
S27
OPERATING SYSTEM UPDATES MANAGEMENT INFORMATION
END

FIG. 10

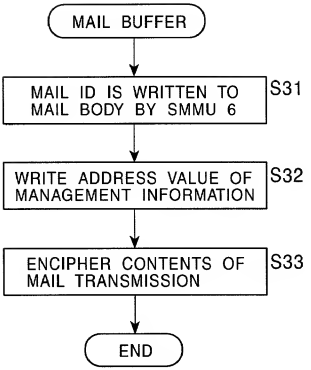

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FIG. 11

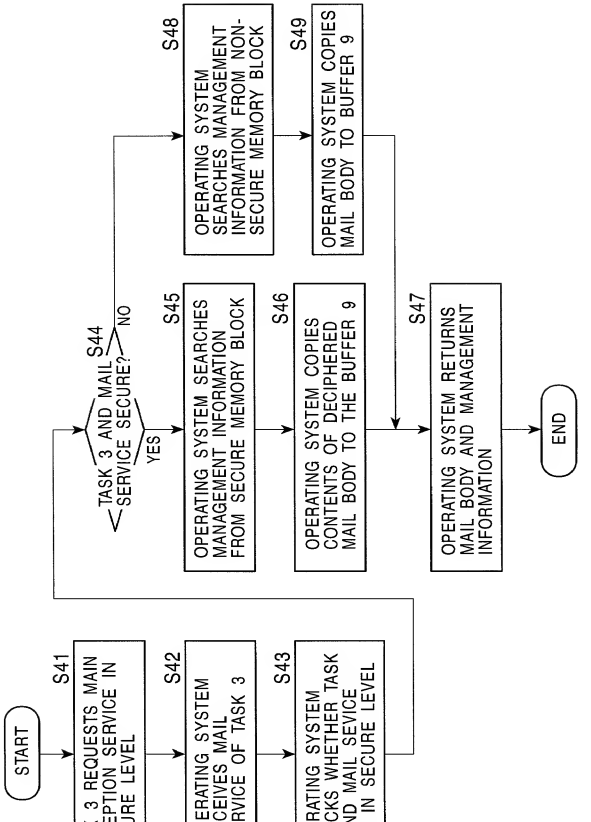
START
S41
TASK 3 REQUESTS MAIN RECEPTION SERVICE IN SECURE LEVEL
S42
OPERATING SYSTEM RECEIVES MAIL SERVICE OF TASK 3
S43
OPERATING SYSTEM CHECKS WHETHER TASK 3 AND MAIL SEVICE ARE IN SECURE LEVEL
S44
TASK 3 AND MAIL SERVICE SECURE?
YES
NO
S45
OPERATING SYSTEM SEARCHES MANAGEMENT INFORMATION FROM SECURE MEMORY BLOCK
S46
OPERATING SYSTEM COPIES CONTENTS OF DECIPHERED MAIL BODY TO THE BUFFER 9
S47
OPERATING SYSTEM RETURNS MAIL BODY AND MANAGEMENT INFORMATION
END
S48
OPERATING SYSTEM SEARCHES MANAGEMENT INFORMATION FROM NON-SECURE MEMORY BLOCK
S49
OPERATING SYSTEM COPIES MAIL BODY TO BUFFER 9

FIG. 12A

MAIL TRANSMISSION

SendMail(int MailBoxNumber, MailBuf *buf, int SecurityLevel)

FIG. 12B

MAIL RECEPTION

RecvMail(int MailBoxNumber, MailBuf *buf, int SecurityLevel)

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